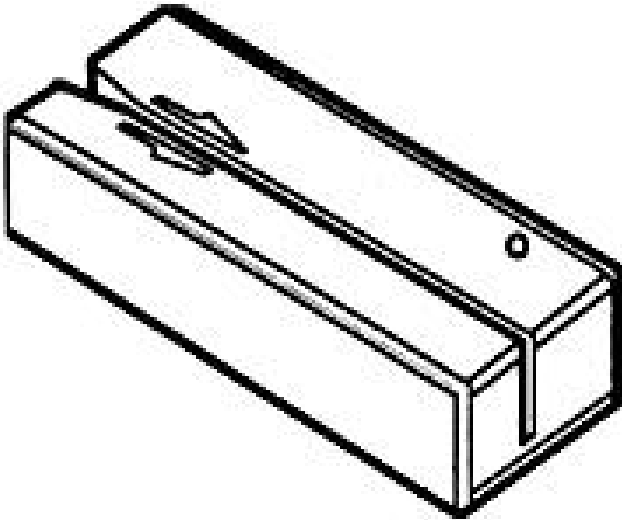# Magnetic Strip Reader

For IBM, XT, AT, PS/2 and Compatible Keyboard Interfaces

# *ID Innovations Incorporated*

Single, Dual, and Triple Track

## FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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# Table of Contents

# Features

The ID Innovations Incorporated Magnetic Card Reader represents the state of the art in keyboard wedge and magnetic stripe card reading. The Magnetic Card Reader is based on ID Innovations Incorporated's True Wedge technology. The advances that True Wedge technology provide are found in enhanced functionality, such as keyboard configurable parameters, self cloning, and auto Caps Lock detection. Other features of the ID Innovations Incorporated Magnetic Card Reader include:

- ✦ Single, dual, or triple track versions allow for reading all types of magnetic cards, including credit/debit cards and drivers licenses
- ✦ Simple installation, Keyboard Wedge, Serial, Wand Emulation
- ✦ Superior keyboard wedge interface - NOVELL compatible - auto Caps Lock detection ensures that the data always appears on the computer just the way it is encoded on the card
- ✦ Simple programming from your keyboard - no need to flip switches!
- ✦ Automatically clones readers in under 10 seconds - over 300 readers per hour
- ✦ Auto detection of the type of computer (PC, XT, AT, PS/2, and XWindow terminals with PC compatible keyboard interface)
- ✦ Can be used with or without the keyboard
- ✦ Supports over twenty different keyboard country layouts
- ✦ Can output any key on the keyboard
- ✦ Programmable preamble, postamble, and termination strings
- ✦ READ/NO-READ indicators (buzzer and bright tri-color LED)
- ✦ Superior reading performance utilizing advanced bit recovery techniques
- ✦ Wide range of card swipe speeds - fast or slow - even with triple track cards
- ✦ Low power consumption
- ✦ Compact size

# Installation - Keyboard Wedge

The Card Reader is installed between the computer and the keyboard. The keyboard cable is plugged into the Card Reader using the connector labeled "KB". The Card Reader is then connected to the computer using the connector labeled "PC". In order to properly install the Card Reader on your computer system, you must use the supplied adapter cable. This adapter cable is a short 6 inch cable with a 5 pin DIN socket on one end, and a 6 pin Mini-DIN plug at the other end. Depending upon your computer system, the adapter cable will be connected to either the keyboard side or the computer side of the Card Reader.

For example, If your computer system uses a keyboard with a 6 pin Mini-DIN connector, then the adapter cable is connected to the cable on the Card Reader labeled "PC".
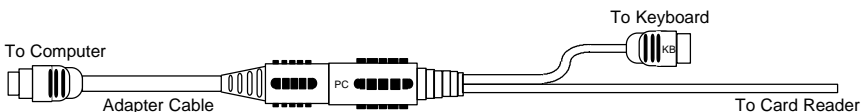


If your computer system uses a keyboard with a 5 pin DIN connector, then the adapter cable is connected to the cable on the Card Reader labeled "KB".
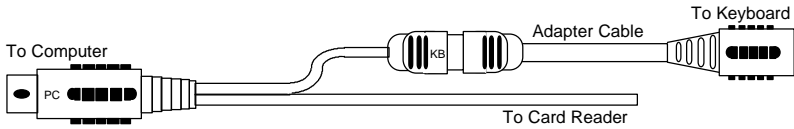
The Card Reader can be mounted in one of two ways, using the Two Velcro® strips included or inserting screws into the four threaded inserts on the bottom of the reader. However, if you choose to mount the unit using the threaded inserts, do not use a long screw in the insert by the cable. There is a socket located above the insert that will be damaged by a long screw.

> *Note: It is recommended that you mount the Card Reader to avoid damaging the cable. Frequent bending of the cable can break the wires within it.*

# Installation - Serial

To install the Card Reader serially you will need a ID Innovations, Serial Converter. The Serial Converter is used to convert TTL signal levels to RS-232 signal levels. The Serial Converter is readily available in a 9-pin straight cable configuration for direct connection to PCs and a 25-pin Y cable configuration for connection between a Terminal and Host devices. When connecting the Card Reader to the Serial Converter the PC side of the Card Reader cable should be connected to the 6-pin connector of the Serial Converter. If you are connecting the Card Reader to a 25-pin Serial Converter, the 25-pin connector marked TERMINAL should be connected to the Terminal side and the 25-pin connector marked HOST should be connected to the Host side. For information on cable pin-outs see Appendix D

> *Note: Do not connect a keyboard to the Card Reader when operating in Serial mode. If you have a keyboard connected to the Card Reader when power is first turned on, the Card Reader will revert back to the Keyboard Wedge mode of operation. A keyboard should only be connected to the Card Reader after power is turned on, so that you may configure the Card Reader using the keyboard.*

> *Note: If you have a device with a powered serial port, that provides +5v @75ma, you may connect the Card Reader directly by using a simple cable adapter and configuring the Card Reader for **Inverted Serial Output**, see I**nverted Serial Output** for more information.*

# Installation - Wand Emulation

To install the Card Reader in Wand Emulation mode you must first configure the Card Reader for Wand Emulation and the proper segment sizes. In this mode of operation, the Card Reader can be plugged into the Wand port of a bar code decoder and the decoded Card Data is transmitted as Code 128 bar codes. In order to connect the Card Reader to the bar code port of a decoder you may have to use a simple cable adapter, for information on cable pin-outs see Appendix D.

> *Note: Do not connect a keyboard to the Card Reader when operating in Wand Emulation mode. If you have a keyboard connected to the Card Reader when power*

*is first turned on, the Card Reader will revert back to the Keyboard Wedge mode of operation. A keyboard should only be connected to the Card Reader after power is turned on, so that you may configure the Card Reader using the keyboard.*

# Operating The Card Reader

The Card Reader is designed to read all of the standard magnetic card formats. To read a card, insert the card in the reader with the magnetic stripe facing the magnetic head in the Card Reader. The magnetic head is located on the same side as the LED on the top of the Card Reader. Slide the card through the Card Reader slot, with a smooth stroke, in either direction. When swiping the card through the Card Reader, the LED will turn off. Once you have completed swiping the entire card through the reader, the Card Reader will then set the LED to either green (for good read) or red (for no read). In addition to the green LED on a good read, the Card Reader will sound the buzzer to give you an audible indication that the card was successfully read, and the data is being transmitted to the computer.

# Using The Setup Mode To Configure The Card Reader

The Card Reader can be configured through the use of the computer keyboard. The Card Reader must be installed and powered to enter the setup mode. Once the unit is powered up, press and hold the following keys:

**Left-Control**, **Caps Lock**, **Right-Shift**, and **Backspace**[1]

- or -

**Left-Control**, **F1**, **Right-Shift**, and **Backspace**[2]

Once you release the keys, the Card Reader will produce a series of beeps, change the LED to orange and display a message similar to the following on your display:

```
F1-F10=Options, Use ARROW KEYS to Toggle/Move, ESC=Exit
```

To ensure that you have enough space on your command line for the Card Reader options to be displayed, we recommend that you either have your command prompt located at the root directory, or that you load an editor with a new file. This will allow the Card Reader to use most of the characters on your computer display. For example, in Windows load Windows Write and in OS/2 load the Notepad program.

Setup is separated into many different categories ranging from "Interface" to "Cloning". The following is a list of function keys and the setup category for which they apply:

---

[1]This is a generic key sequence used to configure any ID Innovations' keyboard wedge device.

[2]This key sequence is used to configure ID Innovations' keyboard wedge Magnetic Stripe Readers only.

| Key | Category | Options |
|---|---|---|
| F1 | Interface | Keyboard Country<br>Transmit Speed<br>CTRL/Special Char Delay<br>Send Numerics As<br>Setup Mode Lockout<br>Output Mode<br>Serial Baud Rate<br>Serial Data Bits<br>Serial Parity<br>Serial Duplex<br>Serial Data Format<br>Inverted Serial Output<br>Serial Intercharacter Delay<br>Serial Caps Lock<br>Serial Num Lock<br>Wand Emulation Append Mode<br>Wand Emulation Max Segment Size<br>Wand Emulation Segment Output Delay<br>Firmware Version and Release Date |
| F2 | Magnetic Stripe | Enable Tracks<br>Require Tracks<br>Data Output Mode<br>Track Output Order<br>Field Output Order<br>EXP DATE Format<br>Expiration Date Separator Char<br>Send 6 Bit Field Separator '^' As<br>Send 4 Bit Field Separator '=' As<br>Send Track 3 Start Sentinel ';' As<br>Send Track 3 Start Sentinel '%' As<br>Send Start & End Sentinels<br>Send LRC Character<br>Send Mag Stripe Hardware Control Characters<br>No Read Output String |
| F3 | Magnetic Stripe Editing | Track1 -or- ACCT # Stripping: # Of Leading & Trailing Chars<br>Track2 -or- NAME Stripping: # Of Leading & Trailing Chars<br>Track3 -or- EXP DATE Stripping: # Of Leading & Trailing Chars |
| F4 | Preambles | Magnetic Stripe Preamble<br>Track1 -or- ACCT # Preamble<br>Track2 -or- NAME Preamble<br>Track3 -or- EXP DATE Preamble<br>Send Preambles/Postambles For Unread Tracks |
| F5 | Postambles | Magnetic Stripe Postamble<br>Track1 -or- ACCT # Postamble<br>Track2 -or- NAME Postamble<br>Track3 -or- EXP DATE Postamble<br>Send Preambles/Postambles For Unread Tracks |
| F6 | Termination String | Termination String<br>Send Termination String |
| F7 | Buzzer/LED | Good Read Beep<br>Beep Tone<br>Beep Duration<br>No Read LED Delay<br>LED Power Save Mode |
| F8 | Diagnostics | Firmware Version and Release Date<br>Keyboard Information<br>Show Scan Codes |
| F9 | Cloning | Lockout Cloned Reader Setup Mode<br>Press ENTER To Begin Cloning |
| F10 | Reset All Defaults | Reset All Defaults? |

For those categories which have more than one option, the UP and DOWN arrow and ENTER keys are used to move from one option to the next. In addition to the UP and DOWN arrow keys, the CTRL UP and CTRL DOWN arrow keys are used to move to the bottom and the top of the list. The following is a list of all special editing keys and a description of their function:

| Key | Description |
|---|---|
| Left Arrow, Right Arrow, Backspace & Space Bar | Toggles through the settings for the current option. |
| Up & Down Arrow | Moves from one option to the previous or next within the category. |
| CTRL Up & CTRL Down Arrow | Moves to the top or bottom of the category. |
| Home & End | Moves to the beginning or end of an input field. |
| ALT Backspace | Toggles the output mode during configuration, between destructive backspace and non-destructive backspace. Defaults to non-destructive backspace. |
| CTRL + Keypad | Increases transmit speed during setup. |
| CTRL - Keypad | Decreases transmit speed during setup. |
| CTRL F7 | Test the current Beep Tone and Beep Duration |
| CTRL F10 | Resets the current option to the default setting. |
| ALT F10 | Resets all options in current category to default settings. |
| CTRL Escape | Exit configuration, saving changes. |
| ALT Escape | Exit configuration, without saving changes. |

*Note: If you experience some character loss during setup, you may press the CTRL-(Keypad Minus) key to slow character transmission. To speed up character transmission, press the CTRL+(Keypad Plus) key.*

*Note: After 5 minutes of inactivity (no key presses) the Card Reader will exit setup mode and save all changes.*

The following sections document all of the setup mode categories and the individual options within each category. Next to the option name is the default setting for the option. In addition to the default setting, the keys that are used for editing are listed to the right of the option name. The meaning of each of the key icons is as follows:

| Key Icon | Meaning |
|---|---|
| zx | The left and right arrow keys scroll through available settings for the option. |
| a | An ALT keypad sequence may be used to enter characters for the setting. |
| ASCII | All ASCII data is valid for the option. All characters are available for entry into the field. |

## Interface                                                            F1

**Keyboard Country: UNITED STATES**                                      **ZX**
The Keyboard Country option is used to inform the Card Reader of the keyboard country that should be used when transmitting card data.  The ID Innovations Incorporated Card Reader supports 21 different settings (PC compatible layout) for the Keyboard Country, ranging from "Belgium" to "Universal".  It is important to note that changing this setting and not changing your computer to the same setting will result in garbled or lost characters.  The settings for this option are as follows:

| | | |
|---|---|---|
| BELGIUM | GERMANY | SPAIN |
| BRAZIL | ITALY | SWEDEN |
| CANADIAN-FRENCH | LATIN AMERICA | SWITZERLAND (FRENCH) |
| CZECHOSLOVAKIA (CZECH) | NETHERLANDS | SWITZERLAND (GERMAN) |
| DENMARK | NORWAY | UNITED KINGDOM |
| FINLAND | POLAND | UNIVERSAL |
| FRANCE | PORTUGAL | UNITED STATES |

>   *Note: If you set the **Keyboard Country** to BELGIUM, FRENCH, or GERMANY, then numeric data is sent faster by setting the **Send Numerics As:** option to NUMERIC KEYPAD KEYS.*

The UNIVERSAL Keyboard Country is not actually a country setting.  In this mode, the Card Reader sends most data to the computer as a series of ALT keypad sequences.  For example, to transmit an "A" to the computer, the Card Reader performs the ALT 065 key sequence on the numeric keypad.  It is important to note that this method of communication may not work with your computer hardware and software.  It is possible that no data will appear on your computer if you set the Card Reader to output in this mode.  If this is the case, you will have to reenter the setup mode and press F1, CTRL F10 and CTRL ESC.  This will reset the Keyboard Country back to the UNITED STATES default setting.

>   *Note: In order for the **Keyboard Country** changes to take effect, you must exit the setup mode and save changes.*

**Transmit Speed, 0=Fastest: 0**                                         **ZX**
The Transmit speed option is used to control the speed at which card data is sent to the computer.  In some instances the Card Reader may overrun the computer if this setting is too fast, or if the computer is busy performing some lengthy operation.  This option ranges from 0 to 99, with 0 being the fastest and 99 being the slowest.

**CTRL/Special Char Delay (milliseconds): 50**                           **ZX**
The CTRL/Special Char Delay is the amount of time the Card Reader will delay after sending a special character or a CTRL key sequence before sending the next character of data.  This option ranges from 0 to 255 milliseconds.  The characters that are affected by this option are those that are non-printable.  For a complete list of the characters, refer to *Appendix-A, Special Characters Table*.  This feature is used to prevent overrunning the keyboard buffer when sending function keys and other non-data characters.

**Send Numerics As: MAIN KEYBOARD KEYS** ZX
This option is used to indicate which numeric keys you want the Card Reader to use when transmitting magnetic stripe data to the computer. If this option is set to MAIN KEYBOARD KEYS, then all numeric data will be sent as numerics on the main keyboard. If this option is set to NUMERIC KEYPAD KEYS, then all numerics will be sent from the numeric keypad.

**Setup Mode Lockout: OFF** ZX
This option is used to allow you to lock out the setup mode until the unit is turned off and then powered back on. Once this option is activated and a magnetic stripe card is read, the setup mode will be locked out. This feature is used to prohibit unauthorized changes from being made to the reader's setup parameters.

**Output Mode: KEYBOARD WEDGE** ZX
This option is used to specify the output mode of the Card Reader. This option may be set to KEYBOARD WEDGE, SERIAL, WAND EMULATION, and KEYBOARD WEDGE - AT ONLY.

**KEYBOARD WEDGE**
In Keyboard Wedge mode the Card Reader will automatically detect the keyboard protocol of the host computer. The Card Reader should be installed as specified in the **Installation - Keyboard Wedge** section of this manual on page 6.

**SERIAL**
In Serial mode the Card Reader will transmit all data serially using the Serial settings below. In order for this mode typically requires you to use a Serial Converter, for more information see **Installation - Serial** on page 6. Plugging the Card Reader into a PC or TERMINAL with a keyboard attached places the reader in keyboard wedge mode, so that you may permanently change the Output Mode.

> *Note: Prior to setting the **Output Mode** to **SERIAL** and connecting the Card Reader serially, configure all of the Serial settings to match your serial device. If you do not properly match the settings, the Card Reader will not output the data properly.*

**WAND EMULATION**
In Wand Emulation mode the Card Reader will transmit all data as bar code wand data. In this mode of operation, the Card Reader can be plugged into a Wand port of a bar code decoder and the decoded Card Data is transmitted as Code 128 bar codes. Plugging the Card Reader into a PC or TERMINAL with a keyboard attached places the reader in keyboard wedge mode. For information see **Installation - Wand Emulation** on page 6.

> *Note: Prior to setting the **Output Mode** to **WAND EMULATION** and connecting the Card Reader to the bar code port of a decoder, properly configure all of the settings to match your decoders capabilities. If you do not properly match the settings, the Card Reader will not output the data properly.*

**KEYBOARD WEDGE - AT ONLY**
In Keyboard Wedge - AT ONLY mode the Card Reader must be connected to a AT compatible keyboard interface. In this mode the Card Reader will not autodetect the

keyboard protocol of the host computer. The Card Reader should be installed as specified in the **Installation - Keyboard Wedge** section of this manual on page 6.

**Serial Baud Rate: 9600**                                            **ZX**
This option is used to control the speed of the serial communications. This option may be set to 300, 600, 1200, 2400, 4800, 9600, 19200, or 38400.

**Serial Data Bits: 8**                                            **ZX**
This option is used to control the number of Data Bits used for each character of serial data. This option may be set to 7, or 8.

**Serial Parity: NONE**                                          **ZX**
This option is used to control the Parity of the serial data that is transmitted. This option can be set to NONE, ODD, EVEN, MARK, or SPACE.

**Serial Duplex: FULL**                                          **ZX**
This option controls the transmission of the serial data to the Terminal side of the Serial Converter. If this option is set to FULL, serial data is only transmitted to the HOST side of the serial connection. If this option is set to HALF, serial data is transmitted to both the HOST and the TERMINAL sides of the serial connection.

**Serial Data Format: ASCII**                                    **ZX**
This option is used to set the format of the data when it is transmitted serially. With the default setting all data is transmitted as ASCII characters. If you set this option to SCAN CODES (PCTERM), all data is transmitted as scan codes. For example, the letter A would be transmitted as the scan code for the key on the keyboard that is used to generate the letter A.

> *Note: The **Keyboard Country** setting effects the scan codes that are transmitted serially. Make sure that the **Keyboard Country** setting matches the Keyboard that you would normally use.*

**Inverted Serial Output: OFF**                                   **ZX**
This option is used to control the format of the transmitted serial data. If you are directly connecting the Card Reader to a serial device with a powered serial port and are not using a Serial Converter, set this option to ON.

**Serial Intercharacter Delay: 1**                                **ZX**
This option is used to control the amount of delay between each of the characters transmitted serially. This option is specified in Milliseconds and ranges from 0 to 50.

**Serial Caps Lock: OFF**                                       **ZX**
When the Serial Data Format is set to SCAN CODES (PCTERM), this option controls the scan codes that are generated for the NUMERIC KEYPAD KEYS. When the Serial Data Format is set to ASCII this option has no effect.

**Serial Num Lock: ON**                                        **ZX**
When the Serial Data Format is set to SCAN CODES (PCTERM), this option controls the scan codes that are generated for the alpha keys. When the Serial Data Format is set to ASCII this option has no effect.

**Wand Emulation Append Mode: OFF**                                    **ZX**
The Code 128 bar code specification defines a FNC 2 character that can be used to
concatenate two or more Code 128 bar codes.  When a bar code with this special
character is read, the decoder, stores the bar code and continues reading until a bar
code without the special character is read.  After reading a bar code without the special
character all stored bar code data is transmitted to the host computer as if one bar code
was read.  This option is used to control the sending of the FNC 2 character.

**Wand Emulation Max Segment Size: 18**                                **ZX**
This option is used to control the maximum number of characters of data that are
transmitted in each segment.  For example, if 30 characters of magnetic stripe data is
read, two segments would be transmitted.  The first segment size would be eighteen
characters and the second would be the remaining twelve characters of data.  Segment
sizes can range from 1 to 99 characters.

> *Note: Your bar code decoder will have a maximum number of characters that
> may appear in a Code 128 bar code.  You should consult your bar code decoder
> manual to determine this number and set the Max Segment Size to the appropriate
> value.*

**Wand Emulation Segment Output Delay: 5**                             **ZX**
This is the amount of time, the Card Reader waits before sending the next segment of
the Magnetic Card data.  This delay is used to give the receiving bar code reader enough
time to process the previously transmitted segment.  This input is in 10ths of a second
and ranges from 0 to 30.

**Firmware Version and Release Date**
This option is an information only option, it displays the internal Firmware version and the
Release Date of that firmware.  This is useful when you wish to know the version and
release date of an ID Innovations Incorporated Card Reader.  When you cursor down to
this option a message similar to the following will be displayed:

```
:Firmware v1.1 Checksum=D3E2 12/22/94
```

# Magnetic Stripe                                                      F2

**Enable Tracks: 1,2,3**                                               **ZX**
The Enable Tracks option is used to enable and disable specific tracks of information on
the Card Reader.  For example, it may be necessary in some applications to use only
Track 2 information. In those cases, Track 2 would be the only track enabled.

**Require Tracks: NONE**                                               **ZX**
The Require Tracks option is used to indicate the tracks that must be read in order to
generate a good read.  If this option is set to NONE, then any track read will be
considered a good read.  This feature is useful if your software requires specific tracks of
data from the card.

**Data Output Mode: TRACK DATA**                                                    **ZX**

The Data Output Mode option is used to indicate the output of the Card Reader.  If this option is set to TRACK DATA, the Card Reader will output the data one track at a time. If the option is set to FIELD DATA, the Card Reader will output the data as NAME, ACCT # and EXP DATE, as specified by the **Field Output Order** option (See Below). The NAME field is found only on track 1 encoded using format B, and is output in the following format: TITLE, FIRST NAME, LAST NAME.  The ACCT # and EXP DATE can be found on either track 1 format b, or track 2.  Both tracks must be adhere to ANSI/ISO specifications for financial transaction cards.

> *Note: If this option is set to FIELD DATA and you attempt to read a card that does not contain the ACCT # and EXP DATE, the Card Reader will produce an error warble.*

**Track Output Order: 1,2,3**                                                        **ZX**

The Track Output Order option controls the order in which the tracks read are output to the computer.  The default for this option sends the tracks in 1, 2, 3 order.

☞       *Note: This option has no effect if the Data Output Mode is set to FIELD DATA.*

**Field Output Order: NAME, ACCT #, EXP DATE**                                       **ZX**

The Field Output Order is used to specify the order of the magnetic stripe field data. When the **Data Output Mode** option is set to FIELD DATA, this option allows you to control the order and appearance of each of the fields output.  The different settings for this option are as follows:

| | | |
|---|---|---|
| NAME, ACCT #, EXP DATE | EXP DATE, ACCT #, NAME | EXP DATE, NAME |
| NAME, EXP DATE, ACCT # | NAME, ACCT # | EXP DATE, ACCT # |
| ACCT #, NAME, EXP DATE | NAME, EXP DATE | NAME |
| ACCT #, EXP DATE, NAME | ACCT #, EXP DATE | ACCT # |
| EXP DATE, NAME, ACCT # | ACCT #, NAME | EXP DATE |

> *Note: This option has no effect if the **Data Output Mode** is set to TRACK DATA.*

**EXP DATE Format: MMYY**                                                            **ZX**

This option is used to control the format of the expiration date when the **Data Output Mode** is set to FIELD DATA.  With this option, the date output can appear as follows: MMYY, YYMM, MM/YY, or YY/MM.  You may use the **Expiration Date Separator Char** option to change the / character between the Month and Year.

                                                                                     **ZX**
**Expiration Date Separator Char: / DEC 47 HEX 2F**                          **ASCIIa**

This option is used to specify the separator character to be inserted between the Month and Year in the Expiration date when the **Data Output Mode** is set to FIELD DATA.  For

example, to insert a TAB between the Month and Year set the Expiration Date Separator Char to **DEC 9 HEX 09**.

> *Note: Setting the Separator Character to a value from **DEC 0 HEX 0** to **DEC 31 HEX 1F** will display an * as the separator character in the **EXP DATE Format** option.*

**zx**
**ASCIIa**

### Send 6 Bit Field Separator '^' As ^ DEC 94 HEX 5E

This option allows you to change the separator character that is sent for tracks encoded with 6 bit data. You may specify any valid character for the **Keyboard Country** that is currently selected. This is a one character input field, press the key that represents the character or use an ALT keypad sequence to specify the character. For instance, to specify DEC 125, press and hold the ALT key while pressing and releasing the 1, 2 and 5 keys on the numeric keypad. This option has no effect if the **Data Output Mode** is set to FIELD DATA.

**zx**
**ASCIIa**

### Send 4 Bit Field Separator '=' As = DEC 61 HEX 3D

This option allows you to change the separator character that is sent for tracks encoded with 4 bit data. You may specify any valid character for the **Keyboard Country** that is currently selected. This is a one character input field, press the key that represents the character or use an ALT keypad sequence to specify the character. For instance, to specify DEC 125, press and hold the ALT key while pressing and releasing the 1, 2 and 5 keys on the numeric keypad. This option has no effect if the **Data Output Mode** is set to FIELD DATA.

**zx**
**ASCIIa**

### Send Track 3 Start Sentinel ';' As + DEC 43 HEX 2B

This option allows you to specify the character to substitute for the track 3 start sentinel so that you can distinguish track 3 data from track 2 data. This is a one character input field, press the key that represents the character or use an ALT keypad sequence to specify the character. This option has no effect if the **Data Output Mode** is set to FIELD DATA.

> *Note: Changing the setting for this option will have no effect if the **Send Start & End Sentinels** option is OFF.*

**zx**
**ASCIIa**

### Send Track 3 Start Sentinel '%' As % DEC 37 HEX 25

This option allows you to specify the character to substitute for the track 3 start sentinel so that you can distinguish track 3 data from track 1 data. This is a one character input field, press the key that represents the character or use an ALT keypad sequence to specify the character. This option has no effect if the **Data Output Mode** is set to FIELD DATA.

> *Note: Changing the setting for this option will have no effect if the **Send Start & End Sentinels** option is OFF.*

**Send Start & End Sentinels: ON**                                    **zx**
This option determines whether the Start and End Sentinels for each of the tracks are
sent with the card data on a good read.  The following is a table of the Start Sentinels per
track:

| Track | Start Sentinel |
|-------|----------------|
| 1 | % |
| 2 | ; |
| 3 | ; -or- ! -or- % |

This option has no effect if the **Data Output Mode** is set to FIELD DATA.

**Send LRC Character: OFF**                                           **zx**
This option determines whether the Card Reader should transmit the LRC character as
part of the card data.  This option has no effect if the **Data Output Mode** is set to FIELD
DATA.

**Send Mag Stripe Hardware Control Chars: ON**                        **zx**
A magnetic stripe card can be encoded with special characters that are reserved for
hardware control.  This option allows the Card Reader to send or suppress these special
characters.  For a complete list of these characters, refer to *Appendix-B, Magnetic Stripe
Character Sets.*

**No Read Output String:**                                           **ASCII**
The No Read Output String is a 32 character string that is sent when the Card Reader is
unable to read a magnetic stripe card.  By default this string is empty, meaning that no
characters are sent to the computer if the card is not read.  Key in the string to be sent
whenever the Card Reader is unable to read a magnetic stripe card.  For full instructions
on editing this field and the special characters that can be used, refer to the **Preambles**
category.

# Magnetic Stripe Editing                                             F3

The Magnetic Stripe editing options allow you to strip leading and trailing characters from
the TRACK or FIELD DATA.  If the **Data Output Mode** is set to TRACK DATA then the
options for TRACK editing are available.  If the **Data Output Mode** is set to FIELD DATA
then the options for FIELD editing are available.  Editing is the last operation on the card
data prior to its transmission to the computer.

**Track 1 Stripping: # Of Leading Chars: 0**                          **zx**
**Track 2 Stripping: # Of Leading Chars: 0**                          **zx**
**Track 3 Stripping: # Of Leading Chars: 0**                          **zx**
These options allow you to strip up to 255 characters of leading data from the specific
magnetic stripe track.  If you attempt to strip more characters than there is data, no
stripping will occur.

| | |
|---|---|
| **Track 1 Stripping: # Of Trailing Chars: 0** | **ZX** |
| **Track 2 Stripping: # Of Trailing Chars: 0** | **ZX** |
| **Track 3 Stripping: # Of Trailing Chars: 0** | **ZX** |

These options allow you to strip up to 255 characters of trailing data from the specific magnetic stripe track.  If you attempt to strip more characters than there is data, no stripping will occur.

| | |
|---|---|
| **ACCT # Stripping: # Of Leading Chars: 0** | **ZX** |
| **NAME Stripping: # Of Leading Chars: 0** | **ZX** |
| **EXP DATE Stripping: # Of Leading Chars: 0** | **ZX** |

These options allow you to strip up to 255 characters of leading data from the specific field.  If you attempt to strip more characters than there is data, no stripping will occur.

| | |
|---|---|
| **ACCT # Stripping: # Of Trailing Chars: 0** | **ZX** |
| **NAME Stripping: # Of Trailing Chars: 0** | **ZX** |
| **EXP DATE Stripping: # Of Trailing Chars: 0** | **ZX** |

These options allow you to strip up to 255 characters of trailing data from the specific field.  If you attempt to strip more characters than there is data, no stripping will occur.

*Note: If the **Data Output Mode** is set to TRACK DATA and you specify to strip 5 characters of leading data from Track 1, then all Track 1 data will be sent after removing the first 5 characters of data.  If you then switch the **Data Output Mode** to FIELD DATA, the Track 1 stripping becomes stripping for the ACCT # and the ACCT # stripping will be set to strip 5 leading characters of data.*

## Preambles                                                                      F4

**Magnetic Stripe Preamble:**                                              **ASCII**
The Magnetic Stripe Preamble is a 32 character string that is transmitted before any card data is transmitted.  This string allows you to ensure that the cursor is positioned at the desired location at the time of a card swipe.  When editing this option, you may use any of the standard keys on your keyboard.  The HOME and END keys will take you to the beginning and end of the Preamble.  In order to allow you to embed any key on the keyboard as part of the Preamble, the Card Reader uses certain ASCII characters as special function characters.  Special function characters are followed by a two digit HEX value that specifies the attributes of the function.  These characters and their function are as follows:

$    Specifies special characters in the string.  A special character is a character that performs a special operation or is a special key on the keyboard, such as a numeric keypad key.  For example, to include an F1 key in the string, enter $80 in the string.  For a list of all of the HEX values and the keys that they represent, refer to *Appendix-A, Special Characters Table*.

**#**   Specifies an ALT keypad sequence.  This is useful when you wish to transmit a graphic character to the computer.  For example, to send ASCII 65, HEX 41 as an ALT keypad sequence, enter #41 sequence in the string.  For a list of all of the HEX values and the keys that they represent, refer to *Appendix-A, ALT Keypad Table*.

**%**   Specifies international characters for the current **Keyboard Country**. International keys are keys such as the ACCENT key.  These keys are specific to the **Keyboard Country** that is currently being used.  The only time that you must use this key sequence to enter an international character is when your current **Keyboard Country** setting does not match the one that you wish to use to generate the character.  If there are international characters in an input string and you change the **Keyboard Country**, the Card Reader will convert the international characters to % sequences for display purposes when configuring the unit.

**\***   Indicates a delay in the string.  This is useful if you desire the Card Reader to delay momentarily while transmitting the string to the computer.  The HEX number that follows the * in the string is the number of hundredths of a second to delay before resuming transmission of the string and card data.  The delay ranges from *00 (No delay) to *FF (2.55 second delay).

**&**   Specifies a keyboard Scan Code to be sent.  This option can be used to emulate a key if it cannot be sent with one of the above special characters.  We recommend you use this option with caution because Scan Codes change for keyboard countries as well as keyboard interfaces and protocols.  To determine the Scan Codes sent for a specific key, use **Show Scan Codes** in the Diagnostics category (**F8**).  The HEX number that follows the & in the string is the Scan Code to be sent, to send multiple Scan Codes you must use & once for each Scan Code.

*Note: In order to include the $,#,%,\* and & characters in the string, you must double the character.  For example, to include a dollar sign and then a carriage return in a string, enter $$$0D at the string prompt.  The consecutive dollar signs indicate that you want to transmit an actual $ and not a special character.*

**Track 1 Preamble:**                                                             **ASCII**
**Track 2 Preamble:**                                                             **ASCII**
**Track 3 Preamble:**                                                             **ASCII**
The Track 1, 2, 3 Preambles are 32 character strings that are transmitted prior to the Track card data.  These options are only available if the **Data Output Mode** is set to TRACK DATA.

**ACCT # Preamble:**                                                          **ASCII**
**NAME Preamble:**                                                            **ASCII**
**EXP DATE Preamble:**                                                        **ASCII**
The Account #, Name and Exp Date Preambles are 32 character strings that are
transmitted prior to the specific field.  These options are only available if the **Data Output
Mode** is set to FIELD DATA.

**Send Preambles/Postambles for Unread Tracks: ON**                          **zx**
This option determines if the Preambles/Postambles are transmitted for unread tracks of
data.  For example, if you swipe a Credit Card and Track 1 is read, but not Track 2, by
default both Preambles/Postambles for Track 1 & 2 are transmitted.  If you set this option
to OFF, only the Preambles/Postambles for Track 1 will be transmitted.

*Note: Changing this option will also change the option under Postambles.*

## Postambles                                                                F5

**Magnetic Stripe Postamble:**                                               **ASCII**
The Magnetic Stripe Postamble is a 32 character string that is transmitted after all card
data is transmitted.  This string allows you to ensure that the cursor is positioned at the
desired location at the time of a card swipe.  Editing in this field is done in the same
manner as in the **Preamble** fields.

**Track 1 Postamble:**                                                       **ASCII**
**Track 2 Postamble:**                                                       **ASCII**
**Track 3 Postamble:**                                                       **ASCII**
The Track 1, 2, 3 Postambles are 32 character strings that are transmitted after the
Track card data.  These options are only available if the **Data Output Mode** is set to
TRACK DATA.

**ACCT # Postamble:**                                                        **ASCII**
**NAME Postamble:**                                                          **ASCII**
**EXP DATE Postamble:**                                                      **ASCII**
The Account #, Name and Exp Date Postamble are 32 character strings that are
transmitted after the specific field.  These options are only available if the **Data Output
Mode** is set to FIELD DATA.

**Send Preambles/Postambles for Unread Tracks: ON**                          **zx**
This option determines if the Preambles/Postambles are transmitted for unread tracks of
data.  For example, if you swipe a Credit Card and Track 1 is read, but not Track 2, by
default both Preambles/Postambles for Track 1 & 2 are transmitted.  If you set this option
to OFF only the Preambles/Postambles for Track 1 will be transmitted.

*Note: Changing this option will also change the option under Preambles.*

## Termination String                                                    F6

**Termination String: $0D**                                            **ASCII**

The Termination String is a 32 character string that is sent by default after all Track data and all Track Postambles.  The default Termination String is the ENTER key.  Key in the string that you wish to use as your termination string.  Editing in this field is done in the same manner as in the **Preamble** fields.

**Send Termination String: AFTER ALL TRACKS**                              **zx**

This option is used to indicate where you wish the Card Reader to insert the termination string.  The Termination String can be transmitted at the following locations: AFTER ALL TRACKS, AFTER EACH TRACK, BETWEEN TRACKS, AFTER ALL DATA, and OFF.  By setting this option to BETWEEN TRACKS, the **Termination String** is sent between any two tracks of data.  For example, if tracks 1, 2, and 3 were all read and the output order was the default 1,2,3, the Termination String will be sent after Track 1 and again after Track 2.  By default the Termination String is sent after all tracks and all individual track Postambles.

### Overview Of Card Data Transmission

By now you realize the great amount of power and flexibility available in the ID Innovations Incorporated Card Reader.  Along with great flexibility comes some increase in complexity, as evidenced by the manner in which all of the Termination String, Preambles and Postambles interact.  For example, if you read a Triple-Track card in the Triple-Track version of the Card Reader and all of the Tracks are transmitted, the output will be as follows, assuming default values for all options:

> <Magnetic Stripe Preamble>
> <Track 1 Preamble><Track 1 Card Data><Track 1 Postamble>
> <Track 2 Preamble><Track 2 Card Data><Track 2 Postamble>
> <Track 3 Preamble><Track 3 Card Data><Track 3 Postamble>
> <Termination String>
> <Magnetic Stripe Postamble>

If the **Send Termination String** option is set to AFTER EACH TRACK, then the following will be the output order if you read a Triple-Track card:

> <Magnetic Stripe Preamble>
> <Track 1 Preamble><Track 1 Card Data><Track 1 Postamble><Termination String>
> <Track 2 Preamble><Track 2 Card Data><Track 2 Postamble><Termination String>
> <Track 3 Preamble><Track 3 Card Data><Track 3 Postamble><Termination String>
> <Magnetic Stripe Postamble>

*Note: If the **Data Output Mode** is set to FIELD DATA, then the output order of the fields will follow the **Field Output Order** and the **Field Preambles** and Postambles will be sent where the **Track Preambles** and Postambles are sent.*

# Buzzer/LED                                                                      F7

**Good Read Beep: ONCE FOR ALL TRACKS**                                           **ZX**
The Good Read Beep is used to configure the number of times the Card Reader beeps
for each track of data read.  The settings for this option are ONCE FOR ALL TRACKS,
ONCE FOR EACH TRACK, and OFF.

**Beep Tone: MEDIUM**                                                             **ZX**
This option is used to change the tone that is generated on a good read.  The available
settings are LOW, MEDIUM, and HIGH.

**Beep Duration: MEDIUM**                                                         **ZX**
This options is used to change the duration of the good read beep.  The available
durations are SHORT, MEDIUM, and LONG.

**No Read LED Delay: 10**                                                         **ZX**
The No Read LED delay is the amount of time that the LED displays red before returning
to the ready green state.  This input is in 10ths of a second and ranges from 0 to 65.
The default is 10 for 1 second.  A value of 0 will set the LED to red and it will not change
back to green until a good read occurs.

**LED Power Save Mode: OFF**                                                      **ZX**
Use this option to enable or disable the LED Power Save Mode on the Card Reader.  In
the Power Save Mode the LED on the Card Reader will only light up on a good or bad
read.  If you have a bad or no read the LED will remain lit until the **No Read LED Delay**
time has expired.  In the Power Save Mode the unit will consume as little power as
possible, this mode is excellent for use with LAPTOP computers where power
consumption is a primary concern.

# Diagnostics                                                                     F8

**Firmware Version and Release Date**
This option is an information only option, it displays the internal Firmware version and the
Release Date of that firmware.  This is useful when you wish to know the version and
release date of an ID Innovations Incorporated Card Reader.

**Keyboard Information**
This option displays the Keyboard ID, Protocol and Scan Code Set that the Magnetic
Card Reader is using.  For example, a message similar to the following is displayed when
connected to a standard IBM AT or Compatible:

```
:Keyboard ID=83AB  Protocol=AT  Scan Code Set=2
```

**Show Scan Codes, SHIFT+ESC=Exit: 5A F0 5A**
Use this option to determine the Scan Codes the keyboard sends for each key. Press
and release any key or combination of keys to view the Scan Codes sent.  This option
will display a maximum of 10 Scan Codes at a time.  Some keys send different Scan
Codes depending on the NumLock, Shift, Control, and Alt key states.

## Cloning                                                                                      F9

The ID Innovations Incorporated Card Reader possesses the exceptional ability to configure another ID Innovations Incorporated Card Reader automatically.  This option, known as Cloning, is extremely useful if you are configuring several Card Readers with the same setup.  With Cloning, you setup the first Card Reader and copy its setup to additional Card Readers.

**Lockout Cloned Reader Setup Mode: OFF**                                                **zx**
This option is used to lock out the setup mode on the cloned reader.  Once the reader has been cloned the only method of changing the setup is by cloning a different setup into the reader, so use this option with caution.  This option is useful for configuring readers to be used in an environment where the setup must not be changed.

**Press ENTER To Begin Cloning**                                                              **e**
Press the Enter key to activate the cloning mode, from this point, all you need to do is unplug the keyboard and plug in the Card Reader to be configured.  The cloning reader will then copy its settings to the other Card Reader, which will beep when it has been successfully cloned.  Unplug the newly cloned Card Reader and repeat the process with the next reader.  Once you have cloned all of the Card Readers, plug the keyboard back into the cloning reader and press the ESC key to exit Cloning.

## Reset All Defaults                                                                     F10

**Reset All Defaults?: YES**                                                             **zx**
Reset All Defaults returns the unit to initial factory settings.

## Exiting Setup Mode and Saving Changes

Once you have configured the Card Reader, press the ESC key until you see the following prompt:

```
Exit Setup? (Press ENTER): YES
```

Use the LEFT and RIGHT arrow keys to toggle between YES and NO, and ENTER once you make your selection.  If you have made any changes to any of the settings, the Card Reader will prompt you to save changes.  If you do not save changes, the Card Reader will discard all changes and display the following message:

```
Setup Aborted - Changes Not Saved
```

If you save changes, the Card Reader will display a message indicating that all changes were saved.  It is important to note that when changing the **Keyboard Country** the following message may be displayed:

```
Setup Complete - Changes Saved
Warning! International Chars May Differ For Keyboard Country
```

This warning is displayed when any of the following options contain international characters that may change from **Keyboard Country** to **Keyboard Country**:

> Termination String
> Preambles

Postambles
Send 6 Bit Field Separator
'^' As
Send 4 Bit Field Separator
'=' As
Send Track 3 Start Sentinel
';' As
Send Track 3 Start Sentinel
'%' As

*Note: A faster method of exiting setup mode is to use the ESC key in conjunction with the CTRL and ALT keys.  Use CTRL ESC to exit setup mode and save all changes, and ALT ESC to exit setup mode without saving changes.*

# Appendices

# Appendix-A Special Characters

**Special Characters Table**

The Special Characters Table is a list of all of the characters that can be entered with the $ special character designator. The $ special character can be used in the **No Read String**, **Preambles**, **Postambles** and **Termination String**. Locate the key that you want to embed and enter the value in the Hex column of the table.

| Hex | Dec | Description | Hex | Dec | Description | Hex | Dec | Description |
|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|
| $00 | 0 | NUL (CTRL @) | $81 | 129 | F2 | $A3 | 163 | 5 Keypad |
| $01 | 1 | SOH (CTRL A) | $82 | 130 | F3 | $A4 | 164 | 6 Keypad |
| $02 | 2 | STX (CTRL B) | $83 | 131 | F4 | $A5 | 165 | 7 Keypad |
| $03 | 3 | ETX (CTRL C) | $84 | 132 | F5 | $A6 | 166 | 8 Keypad |
| $04 | 4 | EOT (CTRL D) | $85 | 133 | F6 | $A7 | 167 | 9 Keypad |
| $05 | 5 | ENQ (CTRL E) | $86 | 134 | F7 | $A8 | 168 | Insert Keypad |
| $06 | 6 | ACK (CTRL F) | $87 | 135 | F8 | $A9 | 169 | Delete Keypad |
| $07 | 7 | BEL (CTRL G) | $88 | 136 | F9 | $AA | 170 | Home Keypad |
| $08 | 8 | BS (Backspace) | $89 | 137 | F10 | $AB | 171 | End Keypad |
| $09 | 9 | HT (Tab) | $8A | 138 | F11 | $AC | 172 | Page Up Keypad |
| $0A | 10 | LF (CTRL J) | $8B | 139 | F12 | $AD | 173 | Page Down Keypad |
| $0B | 11 | VT (CTRL K) | $8C | 140 | Left Shift Make | $AE | 174 | Up Arrow Keypad |
| $0C | 12 | FF (CTRL L) | $8D | 141 | Left Shift Break | $AF | 175 | Down Arrow Keypad |
| $0D | 13 | CR (Enter) | $8E | 142 | Right Shift Make | $B0 | 176 | Left Arrow Keypad |
| $0E | 14 | SO (CTRL N) | $8F | 143 | Right Shift Break | $B1 | 177 | Right Arrow Keypad |
| $0F | 15 | SI (CTRL O) | $90 | 144 | Left ALT Make | $B2 | 178 | Center Keypad |
| $10 | 16 | DLE (CTRL P) | $91 | 145 | Left ALT Break | $B3 | 179 | Insert |
| $11 | 17 | DC1 (CTRL Q) | $92 | 146 | Right ALT Make | $B4 | 180 | Delete |
| $12 | 18 | DC2 (CTRL R) | $93 | 147 | Right ALT Break | $B5 | 181 | Home |
| $13 | 19 | DC3 (CTRL S) | $94 | 148 | Left Control Make | $B6 | 182 | End |
| $14 | 20 | DC4 (CTRL T) | $95 | 149 | Left Control Break | $B7 | 183 | Page Up |
| $15 | 21 | NAK (CTRL U) | $96 | 150 | Right Control Make | $B8 | 184 | Page Down |
| $16 | 22 | SYN (CTRL V) | $97 | 151 | Right Control Break | $B9 | 185 | Up Arrow |
| $17 | 23 | ETB (CTRL W) | $98 | 152 | / Keypad | $BA | 186 | Down Arrow |
| $18 | 24 | CAN (CTRL X) | $99 | 153 | * Keypad | $BB | 187 | Left Arrow |
| $19 | 25 | EM (CTRL Y) | $9A | 154 | - Keypad | $BC | 188 | Right Arrow |
| $1A | 26 | SUB (CTRL Z) | $9B | 155 | + Keypad | $BD | 189 | |
| $1B | 27 | ESC (ESC) | $9C | 156 | . Keypad | $BE | 190 | Num Lock |
| $1C | 28 | FS (CTRL \) | $9D | 157 | Enter Keypad | $BF | 191 | Caps Lock |
| $1D | 29 | GS (CTRL ]) | $9E | 158 | 0 Keypad | $C0 | 192 | Scroll Lock |
| $1E | 30 | RS (CTRL ^) | $9F | 159 | 1 Keypad | $C1 | 193 | Print Screen |
| $1F | 31 | US (CTRL _) | $A0 | 160 | 2 Keypad | $C2 | 194 | Pause |
| $7F | 127 | DEL (CTRL BkSpc) | $A1 | 161 | 3 Keypad | | | |
| $80 | 128 | F1 | $A2 | 162 | 4 Keypad | | | |

**ALT Keypad Table**

The # designator is used to output any character value between 1 and 255. The following table shows the keypad sequence sent to the computer for the # sequence entered. The actual character displayed will depend upon on the software running and the country setting of your computer. In some cases, no actual character is displayed.

| Hex | Keypad | Hex | Keypad | Hex | Keypad | Hex | Keypad | Hex | Keypad | Hex | Keypad | Hex | Keypad |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #01 | ALT 001 | #26 | ALT 038 | #4B | ALT 075 | #70 | ALT 112 | #95 | ALT 149 | #BA | ALT 186 | #DF | ALT 223 |
| #02 | ALT 002 | #27 | ALT 039 | #4C | ALT 076 | #71 | ALT 113 | #96 | ALT 150 | #BB | ALT 187 | #E0 | ALT 224 |
| #03 | ALT 003 | #28 | ALT 040 | #4D | ALT 077 | #72 | ALT 114 | #97 | ALT 151 | #BC | ALT 188 | #E1 | ALT 225 |
| #04 | ALT 004 | #29 | ALT 041 | #4E | ALT 078 | #73 | ALT 115 | #98 | ALT 152 | #BD | ALT 189 | #E2 | ALT 226 |
| #05 | ALT 005 | #2A | ALT 042 | #4F | ALT 079 | #74 | ALT 116 | #99 | ALT 153 | #BE | ALT 190 | #E3 | ALT 227 |
| #06 | ALT 006 | #2B | ALT 043 | #50 | ALT 080 | #75 | ALT 117 | #9A | ALT 154 | #BF | ALT 191 | #E4 | ALT 228 |
| #07 | ALT 007 | #2C | ALT 044 | #51 | ALT 081 | #76 | ALT 118 | #9B | ALT 155 | #C0 | ALT 192 | #E5 | ALT 229 |
| #08 | ALT 008 | #2D | ALT 045 | #52 | ALT 082 | #77 | ALT 119 | #9C | ALT 156 | #C1 | ALT 193 | #E6 | ALT 230 |
| #09 | ALT 009 | #2E | ALT 046 | #53 | ALT 083 | #78 | ALT 120 | #9D | ALT 157 | #C2 | ALT 194 | #E7 | ALT 231 |
| #0A | ALT 010 | #2F | ALT 047 | #54 | ALT 084 | #79 | ALT 121 | #9E | ALT 158 | #C3 | ALT 195 | #E8 | ALT 232 |
| #0B | ALT 011 | #30 | ALT 048 | #55 | ALT 085 | #7A | ALT 122 | #9F | ALT 159 | #C4 | ALT 196 | #E9 | ALT 233 |
| #0C | ALT 012 | #31 | ALT 049 | #56 | ALT 086 | #7B | ALT 123 | #A0 | ALT 160 | #C5 | ALT 197 | #EA | ALT 234 |
| #0D | ALT 013 | #32 | ALT 050 | #57 | ALT 087 | #7C | ALT 124 | #A1 | ALT 161 | #C6 | ALT 198 | #EB | ALT 235 |
| #0E | ALT 014 | #33 | ALT 051 | #58 | ALT 088 | #7D | ALT 125 | #A2 | ALT 162 | #C7 | ALT 199 | #EC | ALT 236 |
| #0F | ALT 015 | #34 | ALT 052 | #59 | ALT 089 | #7E | ALT 126 | #A3 | ALT 163 | #C8 | ALT 200 | #ED | ALT 237 |
| #10 | ALT 016 | #35 | ALT 053 | #5A | ALT 090 | #7F | ALT 127 | #A4 | ALT 164 | #C9 | ALT 201 | #EE | ALT 238 |
| #11 | ALT 017 | #36 | ALT 054 | #5B | ALT 091 | #80 | ALT 128 | #A5 | ALT 165 | #CA | ALT 202 | #EF | ALT 239 |
| #12 | ALT 018 | #37 | ALT 055 | #5C | ALT 092 | #81 | ALT 129 | #A6 | ALT 166 | #CB | ALT 203 | #F0 | ALT 240 |
| #13 | ALT 019 | #38 | ALT 056 | #5D | ALT 093 | #82 | ALT 130 | #A7 | ALT 167 | #CC | ALT 204 | #F1 | ALT 241 |
| #14 | ALT 020 | #39 | ALT 057 | #5E | ALT 094 | #83 | ALT 131 | #A8 | ALT 168 | #CD | ALT 205 | #F2 | ALT 242 |
| #15 | ALT 021 | #3A | ALT 058 | #5F | ALT 095 | #84 | ALT 132 | #A9 | ALT 169 | #CE | ALT 206 | #F3 | ALT 243 |
| #16 | ALT 022 | #3B | ALT 059 | #60 | ALT 096 | #85 | ALT 133 | #AA | ALT 170 | #CF | ALT 207 | #F4 | ALT 244 |
| #17 | ALT 023 | #3C | ALT 060 | #61 | ALT 097 | #86 | ALT 134 | #AB | ALT 171 | #D0 | ALT 208 | #F5 | ALT 245 |
| #18 | ALT 024 | #3D | ALT 061 | #62 | ALT 098 | #87 | ALT 135 | #AC | ALT 172 | #D1 | ALT 209 | #F6 | ALT 246 |
| #19 | ALT 025 | #3E | ALT 062 | #63 | ALT 099 | #88 | ALT 136 | #AD | ALT 173 | #D2 | ALT 210 | #F7 | ALT 247 |
| #1A | ALT 026 | #3F | ALT 063 | #64 | ALT 100 | #89 | ALT 137 | #AE | ALT 174 | #D3 | ALT 211 | #F8 | ALT 248 |
| #1B | ALT 027 | #40 | ALT 064 | #65 | ALT 101 | #8A | ALT 138 | #AF | ALT 175 | #D4 | ALT 212 | #F9 | ALT 249 |
| #1C | ALT 028 | #41 | ALT 065 | #66 | ALT 102 | #8B | ALT 139 | #B0 | ALT 176 | #D5 | ALT 213 | #FA | ALT 250 |
| #1D | ALT 029 | #42 | ALT 066 | #67 | ALT 103 | #8C | ALT 140 | #B1 | ALT 177 | #D6 | ALT 214 | #FB | ALT 251 |
| #1E | ALT 030 | #43 | ALT 067 | #68 | ALT 104 | #8D | ALT 141 | #B2 | ALT 178 | #D7 | ALT 215 | #FC | ALT 252 |
| #1F | ALT 031 | #44 | ALT 068 | #69 | ALT 105 | #8E | ALT 142 | #B3 | ALT 179 | #D8 | ALT 216 | #FD | ALT 253 |
| #20 | ALT 032 | #45 | ALT 069 | #6A | ALT 106 | #8F | ALT 143 | #B4 | ALT 180 | #D9 | ALT 217 | #FE | ALT 254 |
| #21 | ALT 033 | #46 | ALT 070 | #6B | ALT 107 | #90 | ALT 144 | #B5 | ALT 181 | #DA | ALT 218 | #FF | ALT 255 |
| #22 | ALT 034 | #47 | ALT 071 | #6C | ALT 108 | #91 | ALT 145 | #B6 | ALT 182 | #DB | ALT 219 | | |
| #23 | ALT 035 | #48 | ALT 072 | #6D | ALT 109 | #92 | ALT 146 | #B7 | ALT 183 | #DC | ALT 220 | | |
| #24 | ALT 036 | #49 | ALT 073 | #6E | ALT 110 | #93 | ALT 147 | #B8 | ALT 184 | #DD | ALT 221 | | |
| #25 | ALT 037 | #4A | ALT 074 | #6F | ALT 111 | #94 | ALT 148 | #B9 | ALT 185 | #DE | ALT 222 | | |

*Note: The char #00 cannot be output as an ALT keypad character.*

# Appendix-B Magnetic Stripe Character Sets

These tables show the character sets for 6 bit and 4 bit data.  Track 1 is 6 bit, track 2 is 4 bit, and track 3 can be 4 or 6 bit.

## 6 Bit Character Set

| Bits 654321 | Character | Bits 654321 | Character | Bits 654321 | Character | Bits 654321 | Character |
|---|---|---|---|---|---|---|---|
| 000000 | Space | 010000 | 0 | 100000 | @ H | 110000 | P |
| 000001 | ! H | 010001 | 1 | 100001 | A | 110001 | Q |
| 000010 | " H | 010010 | 2 | 100010 | B | 110010 | R |
| 000011 | # | 010011 | 3 | 100011 | C | 110011 | S |
| 000100 | $ | 010100 | 4 | 100100 | D | 110100 | T |
| 000101 | % | 010101 | 5 | 100101 | E | 110101 | U |
| 000110 | & H | 010110 | 6 | 100110 | F | 110110 | V |
| 000111 | ' H | 010111 | 7 | 100111 | G | 110111 | W |
| 001000 | ( | 011000 | 8 | 101000 | H | 111000 | X |
| 001001 | ) | 011001 | 9 | 101001 | I | 111001 | Y |
| 001010 | * H | 011010 | : H | 101010 | J | 111010 | Z |
| 001011 | + H | 011011 | ; H | 101011 | K | 111011 | [ |
| 001100 | , H | 011100 | < H | 101100 | L | 111100 | \ |
| 001101 | - | 011101 | = H | 101101 | M | 111101 | ] |
| 001110 | . | 011110 | > H | 101110 | N | 111110 | ^ |
| 001111 | / | 011111 | ? | 101111 | O | 111111 | _ H |

HHardware Control Character

## 4 Bit Character Set

| Bits 4321 | Character |
|---|---|
| 0000 | 0 |
| 0001 | 1 |
| 0010 | 2 |
| 0011 | 3 |
| 0100 | 4 |
| 0101 | 5 |
| 0110 | 6 |
| 0111 | 7 |
| 1000 | 8 |
| 1001 | 9 |
| 1010 | : H |
| 1011 | ; |
| 1100 | < H |
| 1101 | = |
| 1110 | > H |
| 1111 | ? |

HHardware Control Character

# Appendix-C Magnetic Stripe Track Formats

## Track 1

210 bits per inch, 7 bits per character

| Start Sentinel 1 char | Format Code 1 char | Account # 19 digits max | Field Separator 1 char | Country Code 3 digits max | Name 26 char max | Field Separator 1 char | Expiration Date 4 digits | Addtl | End Sentinel 1 char | LRC 1 char |
|---|---|---|---|---|---|---|---|---|---|---|

Country Code is present only if the Account # begins with "59".

## Track 2

75 bits per inch, 5 bits per character

| Start Sentinel 1 char | Account # 19 digits max | Field Separator 1 char | Country Code 3 digits max | Expiration Date 4 digits | Addtl | End Sentinel 1 char | LRC 1 char |
|---|---|---|---|---|---|---|---|

Country Code is present only if the Account # begins with "59".

# Appendix-D Magnetic Card Reader Pinouts and Specifications

## Pinouts

The following drawing details the pinouts of the keyboard (KB) and the computer (PC) end of the Card Reader cable. Both the keyboard and computer connectors are wired identically to the standard PC keyboard and computer connectors.

KB Connector - 6 Pin Mini-Din Female

1. Keyboard Data
2. Reserved
3. Ground
4. +5 VDC
5. Keyboard Clock
6. Reserved

KB Connector
End View
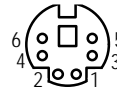
PC Connector - 5 Pin Din Male

1. Keyboard Clock (Wand/Serial Data)
2. Keyboard Data
3. Reserved
4. Ground
5. +5 VDC

PC Connector
End View
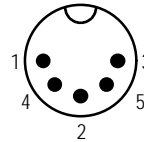
## Specifications

**Electrical**

5 VDC ±5% @ 25 milliamp MAX(standby) - 60 milliamp MAX(operating) - 70 milliamp MAX(setup mode)

**Mechanical**

1.62"W X 1.08"H X 4"L
6' Y-Cable with 6" adapter for 5 pin DIN and 6 pin Mini-DIN connections

**Environmental**

0 - 60° C operation temperature
10 - 90% relative humidity (non condensing)

**Regulatory**

FCC Class A tested and verified

# Appendix-E Troubleshooting and Error Beeps

## Troubleshooting

**Problem**: My computer beeps and some of my card data is missing.
**Cause**: The Card Reader's transmit speed is too fast.
**Solution**: Slow down the Card Reader's transmit speed.


**Problem**: Some of the characters of my card data are garbled or incorrect.
**Cause**: The Card Reader's **Keyboard Country** setting does not match the computer's keyboard setup.
**Solution**: Set the Card Reader's **Keyboard Country** to the same setting as the keyboard on your computer.


**Problem**: My card will not read.
**Cause**: Weak signal on card.
**Solution**: Swipe the card faster.
    - OR -
**Cause**: The magnetic read head is dirty.
**Solution**: Clean the magnetic head. You can purchase Magnetic Stripe head cleaning cards that will allow you to easily clean the magnetic head.
    - OR -
**Cause**: The Card Reader does not have the tracks enabled to read your card.
**Solution**: Reconfigure the reader to enable any disabled tracks.
    - OR -
**Cause**: The Card Reader model that you are using is not the correct model for your card.
**Solution**: Call for assistance in selecting the appropriate reader for        your requirements.
    - OR -
**Cause**: Your card is not properly oriented in the reader.
**Solution**: Orient the card with the stripe facing the LED on the reader.
    - OR -
**Cause**: The data format on your card is not an ANSI/ISO standard.
**Solution**: Call to see if a firmware update is available to read your card format.
    - OR -
**Cause**: Your card has a damaged or unreadable stripe.
**Solution**: Your card needs to be reissued.
    - OR -
**Cause**: The Card Reader is damaged or is no longer functioning.
**Solution**: Call technical support for assistance.


**Problem**: My computer gets a keyboard error while booting up.
**Cause**: The Card Reader is damaged or is no longer functioning.
**Solution**: Disconnect the reader from your computer and use your keyboard only. Reboot your computer. If your computer still gets a keyboard error, then the problem may not be the reader. Call technical support for assistance.


**Problem**: My card has more data on it than my software is expecting.
**Cause**: The Card Reader is sending more tracks of data than your software is expecting.

**Solution**: Reconfigure the reader to either disable or not send unnecessary tracks of data.

**Problem**: My Caps Lock LED on my keyboard flickers when I read a card.
**Cause**: The **Keyboard Country** that you are using requires shifting in and out of the Shift Lock mode to send the data properly.
**Solution**: This is normal operation. You can reduce the flickering and speed the data transmit by sending numerics as keypad numerics, or setting the **Keyboard Country** to UNIVERSAL mode.

**Problem**: My reader does a strange beep and does not output my card data.
**Cause**: The Card Reader is configured to send field data and not track data. The reader was unable to find the ACCT # and EXP DATE fields in the data that was read.
**Solution**: For most credit card applications, configure the Card Reader to require Track 2. In other applications, configure the Card Reader to send TRACK DATA instead of FIELD DATA.

**Problem**: I can't activate the Setup Mode on the Card Reader.
**Cause**: The Card Reader is currently configured to lockout the Setup Mode after a card is read.
**Solution**: Turn the power off and then back on to your computer, and reenter the Setup Mode before reading any cards.
- OR -
**Cause**: The keyboard that you are using does not work properly when you hold down the **Left-Control** and **Caps Lock** keys.
**Solution**: Use the alternate programming key sequence: **Left-Control**, **F1**, **Right-Shift**, and **Backspace**.

**Problem**: My reader displays a warning message about international characters when I exit the Setup Mode.
**Cause**: You have changed the **Keyboard Country**, and there are some international characters being used in one or more of the following options:
Termination String
Preambles
Postambles
Send 6 Bit Field Separator
'^' As
Send 4 Bit Field Separator
'=' As
Send Track 3 Start Sentinel
';' As
Send Track 3 Start Sentinel
'%' As

**Solution**: This is not an error. Verify the characters that you are using in the previously mentioned options to ensure that they output as you expect.

**Problem**: The Card Reader beeps, but no data is displayed on my computer.
**Cause**: The Card Reader is not configured to send the tracks that are on your card.
**Solution**: Reconfigure the Card Reader to send all tracks of data.
- OR -

**Cause**:    The Card Reader is set to strip the same number of characters as there are on your card.
**Solution**: Reconfigure the Card Reader to not strip characters from the tracks of data.
            - OR -
**Cause**:    The card you are reading does not have any data other than the Start Sentinel, End Sentinel, and LRC character, and the reader is configured to send the data without the Start and End Sentinels.
**Solution**: This is not a problem, the reader is functioning properly.
            - OR -
**Cause**:    The Card Reader is configured to send the numeric data as KEYPAD NUMERICS, or the **Keyboard Country** setting is set to UNIVERSAL.
**Solution**: Reconfigure the Card Reader to **Send Numerics As** MAIN KEYBOARD KEYS and set the **Keyboard Country** setting to the country setting of your computer.

**Problem**: My programmable keyboard fails to program when the Card Reader is installed.
**Cause**:    The Card Reader responds to valid keyboard commands from the computer. Most programmable keyboard software programs send characters to the keyboard that are not valid commands.
**Solution**: Remove the Card Reader from the computer before programming your keyboard.

## Hardware Errors

Each time the Card Reader is powered it will go through a system check and verify that all of its hardware is functioning properly.  If the Card Reader finds a problem it will sound a series of error beeps and/or LED changes.  The following is a list of error beeps and LED changes and their meaning.

| | |
|---|---|
| SLOW BLINKING ORANGE LED | CPU ERROR |
| LOW,MED,HIGH BEEP | PROM ERROR |
| FAST BLINKING ORANGE LED | RAM ERROR |
| LOW FOLLOWED BY 2 HIGHER BEEPS | EEPROM ERROR |

# Index